Section I.

Overview of Population Health Improvement

A Conceptual Framework for Population Health Improvement

Combining Military-Unique Programs, Public Health Functions and Health Plan Best Practices

The Department of Defense (DoD) has responsibility for a comprehensive portfolio of health programs to support the national defense strategy and to improve the health of military communities. These programs are very diverse, ranging from traditional health care services provided in hospitals and clinics to environmental health and disease surveillance in remote locations. Health protection, health promotion, treatment and rehabilitative services, and assessing and monitoring health status are all DoD responsibilities.

The programs within the DoD can be considered using a number of different organizational structures. For example, programs can be grouped as those directed by the Army, Navy, or Air Force. A more useful structure for considering programs as they impact population health categorizes programs into three areas; military-unique programs (*Force Health Protection*), programs that are worksite or community-based (*Worksite and Community-Based Programs*), and traditional health insurance and managed health plan programs (*Health Plan: TRICARE Benefit*). This structure is depicted in Figure 1.

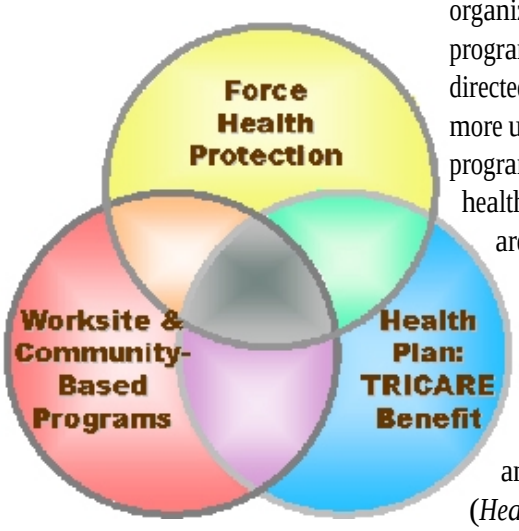


Figure 1. Three areas of DoD

***Force Health Protection* (FHP)** programs include those health services activities that are intended to explicitly enhance military operations. They are targeted primarily at Active Duty, Guard, and Reserve service members. Force Health Protection is a Joint Force strategy that moves beyond traditional medical support for contingency operations to a new doctrine that emphasizes fitness, health promotion and wellness, and the prevention of casualties (http://www.dtic.mil/jcs/j4/divisions/mrd/). Force Health Protection integrates three pillars: *a fit and healthy force*, *casualty prevention*, and *casualty care and management*. While the concepts in the three pillars are not new, current military medical doctrine now clearly articulates how all three must be in place and operating effectively during peacetime and in operational contingencies to fully support deployed fighting forces.

Worksite and community-based programs include the many functions and services that are provided outside of traditional health care settings. Worksite programs may be in an industrial setting such as a shipyard, in an office, or in a unique setting such as a military training center. Occupational health services and health promotion activities at worksites can be among the most effective programs available for impacting individual and community health. Many community-based programs have typically been considered to be the responsibility of public health agencies and specialized service organizations. The core functions and essential services of public health effectively capture the scope of DoD activities for population health improvement (see Textbox). The core functions are health assessment, policy development, and assuring that health services are provided (IOM 1988; Public Health Functions Steering Committee 1995). Examples of worksite and community-

based programs within the DoD include base safety and health committees, environmental and occupational health, family support services, worksite wellness programs, Health and Wellness Centers (HAWCs), fitness centers, health-related education programs, and the Women, Infants and Children (WIC) program for overseas families. These and other worksite and community-based programs play a critical role in improving health in military communities.

Worksite and community-based programs can directly and indirectly impact the health of military communities. Some programs that focus on the non-medical determinants of health can greatly contribute to community health improvement but are not under the direct jurisdiction of military health programs. Health authorities commonly provide advice or collaborate on such programs.

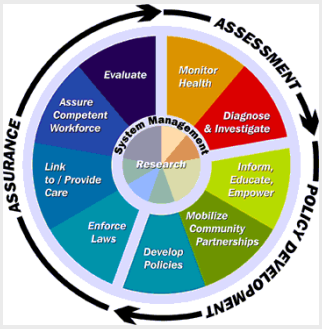
The ***military health plan***, as defined by TRICARE, includes programs that are targeted to active and retired military service members and their families. Health care services under TRICARE are provided through either the arrangement of care provided by civilian providers or delivery of services directly in military treatment facilities. Arranging and directly providing health care services are functions analogous to those of commercial health plans. Military Health System programs that are defined by the TRICARE health plan are directly comparable to programs managed by commercial indemnity and managed care health plans.

Health care services are defined by the benefit package to which individuals or groups have contractually agreed. The federal government, like large commercial health plans, both manages the financial risk for the benefit and serves as the primary provider for services for the military beneficiary population. Furthermore, the DoD is a major purchaser of health services through Managed Care Support Contracts and through the indemnity plan, TRICARE Standard.

The three areas of health programs and the services and functions within them clearly overlap and interact. For example, in executing traditional health services such as acute and chronic disease care under the TRICARE health plan, some of the requirements for maintaining a fit and healthy force are met. Worksite programs that improve the work environment and health of troops also support force health protection and manage demand placed on the health plan. The MHS, in coordination with military departments, must establish the plans, policies, and programs necessary to achieve the mission and must execute programs effectively or assure that health programs are executed by other responsible agencies.

While the MHS is mandated to support military operations and provide or assure health services defined by the TRICARE health plan, it must do so in an environment with increasingly constrained resources. The MHS can meet the challenge to improve value in all services and improve the health of military communities by adopting and adapting the best practices of both public health agencies and model health plans.

Core Functions and Essential Services of Public Health (Public Health Functions Steering Committee 1995)



Assessment includes activities necessary for community health diagnosis. Surveillance, identifying and analyzing problems, collecting and analyzing data, and evaluation of outcomes are some activities of assessment. Through assessment the MHS understands community health needs. Policy development is the function that connects ways and means for solving health problems. It includes processes for making decisions, setting goals, and allocating resources. Assurance is the critical public function to make sure things that should be done get done, doing the right things, and that they are done correctly; that is, doing things right. It makes sure necessary services are provided to reach goals and includes directly providing services if necessary.

The scope of the MHS is broad when conceptualized as a combination of functions core to public health agencies and functions carried out by large health plans today. Add to this the execution of these functions in military-unique environments and a picture unfolds of a health system with a scope and reach that is unparalleled in the world. To put these functions into operation requires an understanding of the factors that impact health, the systematic planning required to prioritize programs, and the concepts and processes of population health improvement at the MTF, Region, and DoD levels.

Defining and Measuring the Health of Populations

What is Health?

The World Health Organization defines *health* as "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity" (WHO 2001). This is perhaps the broadest context for defining the health of individuals or groups of people in a community. Health may be viewed differently from various perspectives. For example, having healthy military troops might mean that personnel are in maximum physical and mental condition to achieve peak performance and to prevent illness and injury. Children's health may be considered differently. Healthy children are not only physically and mentally well but also are growing, learning, and thriving socially.

Health among individuals varies greatly and represents a continuum from one extreme of wellness to the other of illness or impairment. Health can be qualitatively and quantitatively measured and the result is often referred to as *health status*. There are many measures for individual health status such as presence or absence of disability, quality of life, and presence or absence of specific diseases or risk factors.

Population health is "the aggregate health outcome of health adjusted life expectancy (quantity and quality) of a group of individuals, in an economic framework that balances the relative marginal return from the multiple determinants of health" (Kindig 1997). It is also commonplace to describe the health status of the community at large, or population. Life expectancy, for example, is a global measure of the cumulative effect of many factors on a population's health and is a type of survival analysis done only at the population level. Similarly, mortality rates are a global measure of the risk of dying in a population. Community level measures of quality of life or functional status represent the "average" of these measures taken for individuals in the community. The proportion of individuals in the population that have a certain disease or risk factor at a given time yields a prevalence rate for a disease, injury, or risk factor. Other global measures of health include Quality Adjusted Life Years (QALYs), Years of Potential Life Lost (YPLLs), and Disability Adjusted Life Years (DALYs). Any of these measures alone or in combination may be used to describe the health of populations.

Population health improvement is the balancing of awareness, education, prevention and intervention activities required to improve the health of a specified population. This model unites self-care, MTF, worksite and community-based prevention and wellness activities, and medical interventions into a comprehensive paradigm centered on primary, secondary, and tertiary prevention to reduce morbidity and premature mortality and improve health. The objective of population health improvement is to achieve measurable gains in the health of a defined population over some defined period of time. Because community health status can be periodically measured and new knowledge brings improved services and programs, initiatives to build healthy communities will be ongoing. To achieve population health improvement objectives, a systematic approach must be employed at all levels of the MHS to establish, implement and improve population-based plans and programs.

Measuring the Health of Populations

Assessing, or measuring, the health status of populations to support the development of policies and programs in the MHS must be ongoing, comparable among various populations, and must measure effects of the interventions over the interval between assessments. The periodic use of population-based measures must demonstrate not only current health status but also trends and progress made on priority health issues (HHS 1993). Health data from military communities should be comparable among military communities and to other communities to facilitate benchmarking and so that data can be aggregated at Regional levels.

Figure 2.
The health continuum

While counting health events (e.g., illnesses and injuries) is a common activity in medical and public health practice, the systematic use of health data

to improve community health requires measuring lifestyle and behavioral risk factors and the burden of chronic diseases in populations. The identification, investigation and analysis of risk factors require population-based measures. Population-based measures are rates of events in a population. A rate is calculated by dividing the number of events over a specific period of time by the population of interest (e.g., persons at risk for that event). Population health rates, then, use health events in the numerator and the population of interest in the denominator. For a given measure, the time period for counting events and for measuring the population should be the same e.g., one calendar year (Tyler and Dicker 1997). An important requirement of population health measures used to support data-driven population health decisions is to clearly define the numerator and denominator of each measure.

For population health measures to support surveillance and performance measurement they should be measured periodically over time and comparable among measurement periods to support trend analysis (HHS 2000). The frequency at which each measure is collected should be determined by the interval over which meaningful change can be expected and be linked to long, intermediate, and near-term objectives for health programs (see *Using Objectives for Improving Health Status and for Monitoring Performance*).

Determinants of Health

To improve the health of individuals and of whole communities, one must start with an understanding of the factors that impact on both individual and community health. These factors are commonly referred to as *determinants of health* (Figure 3). Healthy People 2010 (http://www.health.gov/healthypeople/), the national initiative for health promotion and disease prevention, presents an overview of how individuals' behaviors, biology, and physical and social environments interact to positively and negatively impact health (HHS 2000). Healthy People 2010 also describes how policies, programs and access to quality health care directly and indirectly influence the health status of individuals and communities.

An individual's *biology* is a result of their genetic makeup and the cumulative effect of exposures and other events that can cause permanent or temporary alterations in health. Some biological attributes positively impact health while others have negative impacts. For example, specific genes in women confer increased risk for breast cancer while other genetic factors contribute to a lower risk for coronary artery disease.

Behaviors and conditions in the physical and social environment can also affect health. Some behaviors, such as a physically active lifestyle, have positive health effects. Other behaviors, such as smoking, have negative effects. Exposure to polluted air, high noise levels without hearing protection and extreme environmental conditions (e.g., hot, cold or dry conditions) without proper protection are examples of factors in the *physical environment* that can adversely impact the health of individuals.

The presence of family, a strong social network, or religious association are examples of healthy factors in one's *social environment*. Associating with a group of friends that binge drink alcohol is an example of an unhealthy factor in

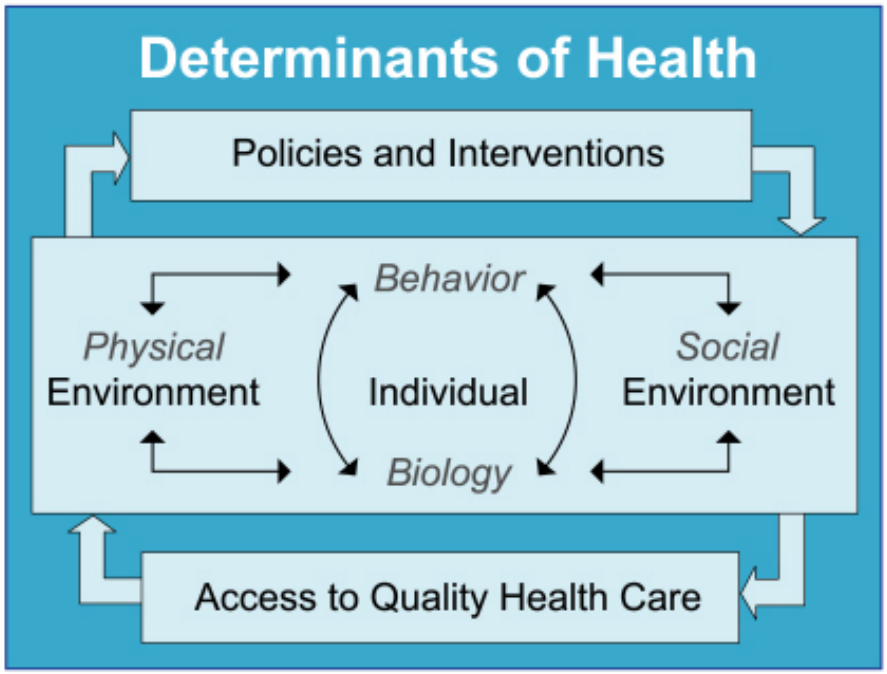


Figure 3.
Determinants of health (HHS 2000)

one's social environment. The key point is that all these determinants interact to influence the health of individuals and communities.

The presence or absence of factors that can impact health can be assessed in individuals, at worksites, and in military communities. *Policies and interventions* can be targeted to specific populations to mitigate factors that increase the risk for disease or injury. Policies requiring immunization of children prior to entry into school and legislation to reduce driving under the influence of alcohol are two examples.

Specific policies and interventions can also be developed to increase the prevalence of factors that improve health or decrease the risk for disease or injury. For example, community programs to discourage binge drinking of alcohol can be targeted to those groups where such behavior is most prevalent. Also, a meningococcal vaccine program might target military units that are deploying to a location where the risk for the vaccine-preventable disease is high.

Access to quality health care is of paramount importance to ensure that all persons receive effective health services when and where it is needed. For example, children must have access to care to receive appropriate immunizations and failure to receive apprropriate immunizations places entire communities at increased risk for disease.

It is important to consider the relative importance of various determinants of health in MHS population health improvement initiatives. The graphs in Figure 4 show that the leading disease-specific causes of death in the United States have behavioral, lifestyle and environmental *actual causes of death* (the direct contributing factors that lead to the diseases that cause deaths). The ten leading causes of death represent the pathophysiological conditions present at the time of death rather than the internal and external factors that were the causes of the pathophysiological conditions. The actual causes of death show that most of the burden of chronic and acute disease and injury is the consequence of identifiable risk factors. Many of the risk factors can be attributed to health risking behaviors and preventable infections and injuries. While treating the pathophysiological conditions in individuals is of great importance in population health, decreasing risk for disease by mitigating risky behaviors and protecting communities from infectious and toxic agents will contribute even more to population health by preventing disease, injury and disability and improving both quality of life and longevity.

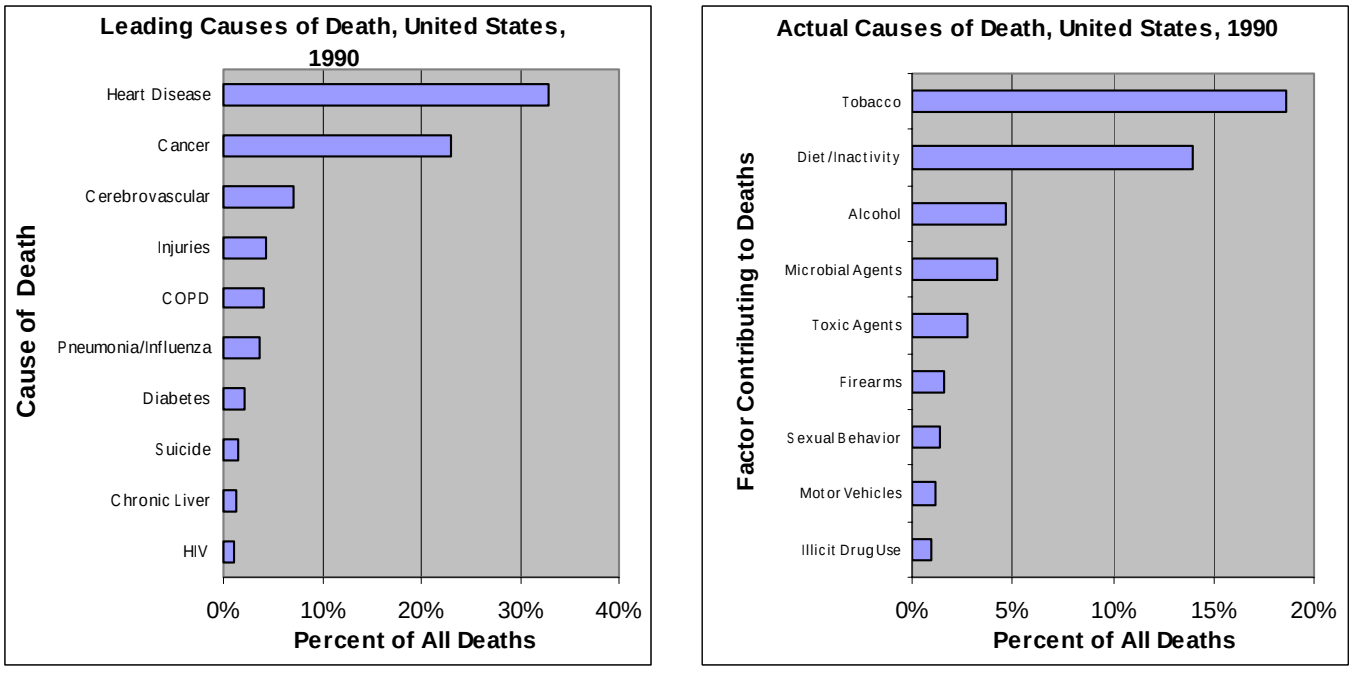


Figure 4.
Comparing leading and actual causes of death (McGinnis and Foege 1993)

Primary, Secondary, and Tertiary Prevention Strategies

The health continuum can be used to conceptualize the potential for individuals' health status to progress from good health to at-risk for disease or injury to diseased or injured to impaired. It is possible for individual health status to move toward health as well. This conceptual progression illustrates three intervention points to target strategies to prevent individuals from moving toward illness and move some toward wellness. The three intervention points are when individuals are well or have identified risk factors for diseases or injuries; when individuals have early, asymptomatic diseases or injuries; and when individuals have symptomatic diseases or injuries. The three strategies that can target these points are referred to as *primary prevention*, *secondary prevention*, and *tertiary prevention* (Turnock 1997). Figure 5 illustrates the relationship between the health continuum, intervention points and prevention strategies.

Primary prevention is the strategy to prevent disease or injury through two approaches; reducing risk factor levels and reducing exposure to potentially harmful agents or conditions. *Health promotion* is the term used to describe those activities that reduce risk factor levels by modifying behaviors that can affect exposure to harmful agents or conditions. Examples of health promotion activities in the clinical setting at an MTF include diet and exercise counseling and health education. Health promotion activities at worksites or in the community may include policies that promote physical activity or provision of recreational facilities, and housing and building standards. *Health protection* activities attempt to decrease the likelihood for harmful interactions between individuals and toxic factors and to increase resistance to potentially harmful factors. Environmental policies, industrial hygiene programs, and immunizations are examples of activities that protect groups from harmful effects of toxic or virulent agents (Turnock 1997).

Secondary prevention refers to early detection and prompt treatment of diseases or injuries when they are at an *early, typically asymptomatic, stage*. By detecting diseases and injuries early, secondary prevention may return individuals to a state of health, or significantly limit the damage to individuals' health, and prevent recurrence. Community-based, worksite and clinic-based screening programs are examples of secondary prevention activities. The MHS is putting a high priority on integrating secondary prevention into routine clinical activities. A program to detect latent tuberculosis infection (positive PPD) in high-risk individuals is an example of case finding as a secondary prevention activity (Turnock 1997).

Tertiary prevention includes familiar clinical activities such as *treatment of symptomatic acute and chronic diseases and injuries* to limit further damage to health and restore function (Turnock 1997). It includes rehabilitation where damage has already occurred. Increasingly, individual case and condition/disease management programs are used to achieve increased effectiveness and efficiency from tertiary prevention services.

Within the DoD programs for Force Health Protection, worksite and community-based population health, MTFs and TRICARE health plan, prevention strategies must be employed in a balance that optimizes population health. Force Health Protection is not only about casualty care, a tertiary prevention strategy, but puts renewed emphasis on primary and secondary prevention strategies to prevent disease and injury and improve health. For example, Force Health Protection is about ensuring that troops are protected from hazards such as vaccine-preventable infections and are in top physical and mental condition to remain resilient to injury and illness.

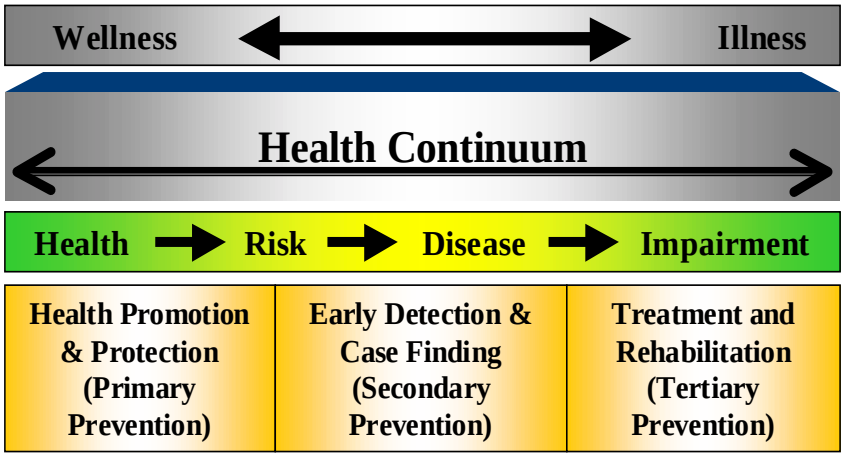


Figure 5.
The relationship between the health continuum, intervention points, and primary, secondary, and tertiary prevention strategies

Worksite and community-based programs emphasize health promotion and protection and can also present good venues for secondary prevention activities. Finally, though the current TRICARE health plan is directed mostly at diagnosis and treatment of established diseases and injuries, coverage is increasing for primary and secondary prevention services. Military Health System programs are putting more emphasis than ever before on ensuring that MTF and contract providers improve delivery of recommended preventive services to promote wellness, prevent disease and injury, and thereby extract the best value from clinical capacity.

The imperative to maximize primary prevention wherever possible is exemplified by the burden of illness from lung cancer. Cancer is the second leading cause of death in the United States and carcinoma of the lung is the number one cause of cancer deaths for both women and men. The overall death rate from lung cancer peaked around 1990 and has declined slightly since (Figure 6) (Fielding, Husten and Eriksen 1998).

This success, however, is not due to progress in secondary or tertiary prevention. In fact, the 5-year survival rate for lung cancer has remained at less than 13% for many years, and there is not an effective method of screening for lung cancer (U.S. Preventive Services Task Force 1996). Smoking is the leading preventable cause of deaths overall, including deaths from lung cancer. Eighty-three percent of lung cancer deaths are attributable to smoking (Fielding, Husten and Eriksen 1998). Environmental tobacco smoke has been proven to cause lung cancer in non-smokers as well. Health promotion and protection activities to prevent smoking initiation, assist smokers to quit, and to protect non-smokers from tobacco smoke have been credited with the recent decline in lung cancer death rates in men (CDC 1999).

The story for lung cancer is an example of the potential of primary prevention strategies to impact a leading cause of premature morbidity and mortality. Using a systematic approach based on knowledge of the health status and distribution of determinants of health in populations will ensure that DoD organizations develop and execute effective policies and interventions to improve the health of military communities.

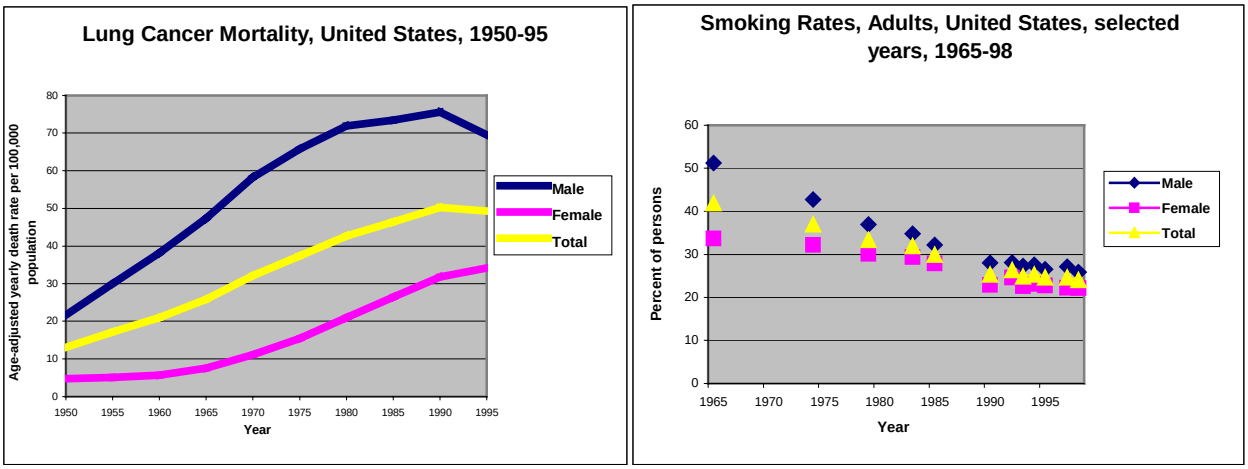


Figure 6.
Lung cancer mortality (CDC 1993; NCI 2001) and smoking trends (NCHS 2000)

Making Population Health Improvement a Reality in Department of Defense

A Systematic Approach

A systematic approach to population health improvement implies that activities are derived from organizational goals and objectives, use population-based health methods to plan, resource and implement policies and programs (including health care services), and achieve measurable gains in the health status of military communities.

Starting at the highest levels of the organization and cascading to the local level, activities must be aligned with the Department's mission, vision and goals. The mission is what the organization is currently doing. The vision is where it wants to be in 5-10 years. The goals can be used to develop a strategic plan for how the vision will be reached. Within the strategic plan are short-, intermediate-, and long-term goals that are measured quantitatively with specific objectives. In population health, the vision is healthy people, healthy worksites, and healthy communities. The local strategic plan should describe how to reach goals and objectives that reflect the best possible health status for individuals, worksites, and military communities.

The DoD enterprise, TRICARE Regions, Services, and MTFs should all employ a systematic and evidence-based approach for developing health plans, policies and programs. Integrated approaches that combine the best evidence-based disease and injury prevention and intervention paradigms will be the most successful.

Planning and prioritization should be driven by population health data and by other priorities set forth by leadership. The planning process and resultant policies and programs should reflect the application of population-based epidemiologic methods. Also, organizations should align the measurement of program performance with pre-established objectives for population health improvement. This requires an overall information management strategy that links the plans and priorities to operational activities. A gap analysis should be completed to identify changes needed to implement population health improvement plans. Finally, plans and programs should drive resource requirements so that the right capacity and capability of personnel and appropriate space, funding, and materiel are employed to achieve population health improvement objectives.

Plans, Policies, and Programs

At any given time, the responsibilities of the MHS are being met through established programs that address previously identified and prioritized problems. However, the health of a population and the political and scientific bases for health service activities are very dynamic. New health issues continue to emerge, new interventions are found for problems already targeted by established programs, and new information about the distribution and determinants of health problems in the population suggest the need for new priorities or other approaches. Therefore, each organization must have ongoing mechanisms for health planning and programming that capture the dynamic nature of population health improvement. An analysis of the performance in core public health functions by over 2800 local health departments in the United States showed that departments that used a formal

Military Health System Mission, Vision, and Goals

MISSION

The Military Health System (MHS) mission is to support the Department of Defense (DoD) and our nation's security by providing health services for the full range of military deployments and by sustaining the health of members of the armed forces, their families and others.

VISION

The MHS is responsive and accountable to DoD, line leadership, and our beneficiaries to ensure force health protection and optimize the health of MHS beneficiaries by providing best value health services using best clinical and business practices.

GOALS

- Protect our forces from medical threats anywhere in the world under any circumstances.
- Employ a comprehensive health plan for those entrusted to DoD's care.
- Create healthy communities through the use of health promotion and prevention activities.
- Fully optimize clinical outcomes across the MHS.

planning process had higher performance scores for the eight public health functions analyzed (Suen, Cooper and Taylor 1995). Agencies using a formal planning tool had the best performance scores for health-related data collection, surveillance, and outcome monitoring and for investigation and control of diseases and injuries.
Several community-based models have been developed to help with community health assessments and planning. Three examples of such planning models are found in the following tools (see references for links to these):

- Assessment Protocol for Excellence in Public Health (APEX/PH) (NACCHO 1991)
- Planned Approach to Community Health (PATCH) (HHS 1993)
- Healthy Communities 2000: Model Standards (APHA 1991)

All three planning tools have similar models for integrating health assessment and surveillance in community health planning. In developing and monitoring a community health plan, health problems are identified and analyzed based on epidemiologic methods that link health problems to possible interventions. The organization should have data to describe the burden and distribution of health problems in the population. The overall burden of health problems in the community can serve as a starting point for prioritizing and analyzing health problems. Health problems are then prioritized to dictate policies and programs based on available resources. These and other formal health planning tools can prove helpful to MTFs and other organizations when conducting regular and periodic health planning.

To improve the health of military communities, the DoD must continuously plan and develop policies and programs using a cyclical approach. The cycle includes all these steps; assessing the health status of beneficiaries, identifying risk factors for disease and injuries under the framework of determinants of health, prioritizing health problems, developing and implementing programs, and then reassessing the health status of beneficiary populations.

Principles Guiding Population Health Plans, Policies, Programs

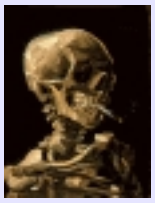
In all DoD activities—those in Force Health Protection, worksite and community-based programs, and TRICARE—plans, policies, and programs will be most effective at improving population health if four population health principles are employed. The principles are:

- Define the populations targeted for interventions,
- Use applied epidemiology,
- Use evidence-based clinical and business interventions, and
- Manage information to support ongoing health status assessment, planning, and performance monitoring and improvement.

Defined Populations

The first step in developing health policies, programs and interventions is to *define the population* that is at-risk for health altering events, such as diseases or injuries. There are innumerable ways to define populations but a practical starting point is to use the health assessment that identified the problems in the community. For example, if back injuries have been identified as a priority problem among active duty troops on base then the population could be defined by the base active duty population. Larger populations might be considered when planning health services under the TRICARE health plan. The population might be identified as those beneficiaries living in the catchment area for purposes of planning services and resources to provide care in the MTF and through contract services in the local community.

Smoking rates among military personnel have been higher than the overall US rates for the past 20 years. The overall smoking rate among Active Duty military personnel in 1998 was 30 percent, well above the national rate of 24 percent. Smoking is the leading preventable cause of premature mortality in the United States. It causes morbidity and mortality from cardiovascular, cerebrovascular and respiratory disease, cancers and other diseases. Given the high smoking rates among military personnel and the huge burden of smoking-related morbidity and mortality throughout the US population, it is not surprising that smoking is a major risk factor for many of the health problems and chronic diseases treated by military providers. Therefore, smoking may exemplify a high priority health problem to target in MHS programs. Similarly, smoking rates and other measures of the results of programs targeting smoking can be periodically assessed.



Smoking as a health problem and smoking prevention and cessation as interventions are realistic and tangible examples for presenting the principles and processes of population health improvement.

A specialized diagnostic or therapeutic service provided by a Center of Excellence might define the population as those living within the TRICARE Region, or even the entire MHS beneficiary population.

A deployable Army unit or the crew on a ship may be the population for a Force Health Protection activity such as an immunization program for troops likely to go to the Middle East. For MTF activities to implement the TRICARE health plan, the MTF enrolled population can be used to define the population for planning MTF-specific policies and programs. Defining the populations assigned to individual Primary Care Managers (PCMs) i.e., the patient panel, is perhaps the most useful way to identify groups of beneficiaries that are small enough to target patient-specific primary, secondary and tertiary prevention interventions. Worksite and community-based planning for policies, programs, and interventions may want to include all TRICARE beneficiary groups (TRICARE enrollees as well as those not enrolled) in defining populations at risk for acute or chronic diseases and injuries and lifestyle or behavioral risk factors.

Applied Epidemiology

Epidemiologic methods are used to describe the distribution and determinants of disease and injury in the population and of the risk factors and underlying causes of diseases and injuries. They also help in identifying possible interventions to resolve problems. Health information used at all levels for population health improvement must accurately represent the distribution of morbidity and mortality in the community and their causes. Surveillance of a wide array of health data sources is necessary for the identification of health events or trends that may warrant action. The population health information must be acquired and applied based on the science of epidemiology (Tyler and Dicker 1997).

The following terms are important in using principles of applied epidemiology in planning population health policies and programs:

- *Health problems* are any health issues that the community defines as problems. Health problems are typically undesirable conditions such as death, disease, or disability (NACCHO 1991). Epidemiologic methods for identifying and investigating adverse health events can support data-driven problem definition. For example, disease-specific death rates in a sub-population of the community or injury rates within a geographic area may be used to describe problems for action.

- *Risk factors* are "Scientifically established factors (determinants) that *relate directly to the level of a health problem*" (NACCHO 1991). There may be numerous risk factors for a given health problem and, conversely, any given risk factor may contribute to numerous health problems.

- *Direct and indirect contributing factors.* Factors that have been scientifically established to directly affect the level of a risk factor are *direct contributing factors*. Those community-specific factors that affect direct contributing factors are *indirect contributing factors* (NACCHO 1991).

Epidemiology is applied in population health programs through four tasks: surveillance, investigation, analysis, and evaluation. *Surveillance* is the ongoing collection and analysis of health data for the support of health planning, programming and evaluation. Monitoring the overall health status of the population or sub-populations to identify possible health problems is part of surveillance. Epidemiologic *investigations* study health problems to identify characteristics of health events and risk factors or contributing factors. *Analysis* is the formal task of taking data about health problems and converting it to information that will lead to interventions. Investigation and analysis identify risk factors and direct and indirect contributing factors of health problems. *Evaluation* is the assessment of health policies and programs against their intended objectives in addressing problems.

The epidemiologic tasks of surveillance, investigation and analysis are used in health planning and all depend heavily on population-based health data. The tasks result in a series of hypotheses about a health problem. These hypotheses eventually lead to interventions for addressing the problem. Figure 7 shows how a health problem identified through ongoing surveillance can be investigated to identify risk factors and then analyzed for direct and indirect contributing factors. The analysis continues with the identification of interventions for possible implementation.
The applied epidemiology process can directly support the need to manage services provided under the TRICARE health plan. The need to effectively

match health services capacity with demand for services requires a process to *forecast demand*. Through the application of epidemiologic methods, information about known health status or projected health problems in populations can be used to project the timing, scope, and quantity of each type of service or intervention that will be requested or needed by the target population. This should include proactive identification and delivery of all recommended clinical preventive services. Also, this approach is used to determine the need, or demand, for Force Health Protection, worksite, community-based, and MTF programs.

Evidence-based Interventions

There is a growing demand in public health and medical practice to use explicit evidence-based information to improve the effectiveness of health services in achieving population health improvement objectives. Evidence-based medicine is a term used to describe the use of practices and interventions that have been derived from explicit scientific methods for proving effectiveness. Evidence-based principles that include systematic reviews of scientific evidence have been used in developing prevention guidelines beginning with the early work done by the Canadian Task Force on the Periodic Health Examination and the U.S. Preventive Services Task Force (Wallace 1998). The terms *evidence-based medicine* (EBM) and *evidence-based health care* (EBHC) are sometimes used to describe evidence-based principles and practices applied in direct patient care (EBM) and in worksites, communities, and populations (EBHC).

Evidence-based practices, as they apply to MHS population health improvement and optimization, can be considered in two categories: 1) *evidence-based primary, secondary, and tertiary prevention*, and 2) "evidence-based" *business practice*. By using evidence-based prevention strategies the MHS will ensure that all health programs targeting individuals and populations are "doing the right thing" to improve community health. Sound business practices, though not necessarily proven using scientific methods, are about using valid management and business practices to ensure that health programs are "doing things right" to get the best value from health programs.

Evidence-based primary, secondary, and tertiary prevention

The application of systematic methods to review and analyze scientific evidence on health interventions has led to the development of guidelines that describe the best population health and clinical approaches to specific risks, diseases and injuries. The intention in developing guidelines is to systematically apply what is known and not known about preventing, diagnosing, and treating diseases and injuries to identify for health professionals the interventions that are most effective. In addition, this system-

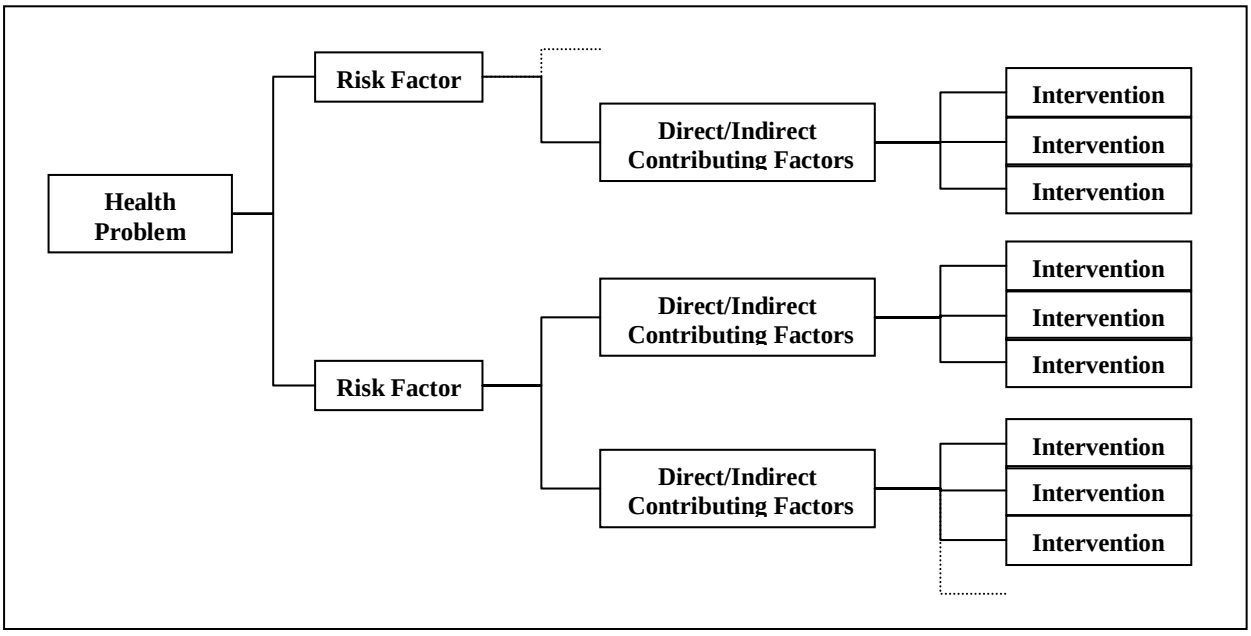


Figure 7.
Applied epidemiology process (NACCHO 1991)

atic process identifies areas where further research is needed to fill gaps in the evidence.

Primary and secondary prevention guidelines have been developed for clinical settings and are described in the *Guide to Clinical Preventive Services* (http://www.odphp.osophs.dhhs.gov/pubs/guidecps/), developed by the U.S. Preventive Services Task Force (1996). This "clinical guide" provides recommendations and discussion for clinicians on how to prevent and screen for numerous priority diseases and injuries and provides guidelines based on age group and risk stratification.

Guidelines for prevention activities in the community setting are being developed and released in phases as the *Guide to Community Preventive Services* by the Task Force on Community Preventive Services (2000). This "community guide" will provide recommendations for population-based interventions for health promotion, specific disease and injury prevention, and health protection.

Many guidelines are available that recommend tertiary prevention (treatment and rehabilitation) interventions. Disease treatment and rehabilitation guidelines are called *clinical practice guidelines (CPGs)*. Most CPGs target specific diseases, conditions, or symptoms. A Department of Defense and Veterans Administration Workgroup has developed CPGs for asthma, diabetes, and a variety of other health conditions (http://www.cs.amedd.army.mil/qmo/Home.htm). Developing CPGs is a complex task; therefore, it is not surprising that there is only a handful of *evidence-based* guidelines available today (see Evidence-based Primary, Secondary, and Tertiary Prevention, in Section IV).

"Evidence-based" business practice

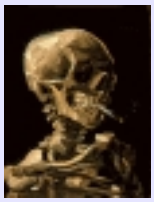
Setting standards for business practice requires the use of proven business and program management tools. In the past, standard operating procedures for managing health services were often based on military and civilian inspection criteria. We now know that this is not enough. Business tools, models, and experience can help organizations effectively meet and manage the demand of their populations. The MHS Health Care Reengineering Program (http://www.tricare.osd.mil/hcr) is a forum for sharing and retrieving experiences with health services innovation. Within this guide are tools to help organizations *forecast demand* for products, resources, and services (see Forecast Demand, Section IV). *Demand management* tools help MTFs and other organizations manage demand for health services using methods proven in commercial and government health plans (see Manage Demand, Section IV). Resource management tools such as business case analysis and workload models help MHS organizations to *manage capacity,* project future needs, and make long-term realignment decisions. A few of the many business and cost analysis models are cost/benefit analysis, cost/utility analysis, cost minimization, and cost-effectiveness analysis (see below).

A limited discussion of business analysis and management models in the context of population health improvement is presented under Manage Capacity, in Section IV. Interested readers can learn more about specific business analysis tools for health services management in the health management literature.

Cost-effectiveness

Cost-effectiveness analysis in population health is a method of combining clinical

An MTF planner finds that *acute exacerbation of asthma* is among the most common diagnoses resulting in acute visits to the outpatient clinics. Further analysis reveals that most patients presenting acutely and who are diagnosed with asthma are children. In the process of planning to address this problem, the target population is identified as children enrolled to the MTF and who are between ages 1 and 18 years. The epidemiologic process determines several risk factors for acute asthma including upper respiratory tract infection, exposure to environmental tobacco smoke, ineffective use of prescribed preventive medications, and even active smoking by some youth.



In pursuing exposure to environmental tobacco smoke as a risk factor for possible intervention, factors are identified that directly and indirectly contribute to children being exposed to environmental tobacco smoke.

A direct contributing factor for some children is that they live with an adult who smokes in the home. An indirect factor that is modifiable is that many adults are not aware of the effects their smoking inside the home has on a child's asthma. The planner is now close to identifying potential interventions for addressing the health problem in the identified population.

effectiveness with costs of health interventions. Cost-effectiveness analysis allows comparisons of various interventions by developing measures of the cost per amount of "health" gained from an intervention (using units such as lives saved or cases prevented) (Turnock 1997). The increasing application of cost-effectiveness analysis in population health research is building a body of information about the impact of interventions on the health of populations as a function of the cost of implementing health programs. Clearly, this information will be highly valuable to health planners faced with prioritizing programs (Maciosek 2001).

In summary, Force Health Protection, worksite and community-based, and TRICARE health plan programs can all incorporate evidence-based interventions. Force Health Protection programs can employ evidence-based primary, secondary, and tertiary prevention in each of the three pillars—fit and healthy force, casualty prevention, and casualty management. Military doctrine provides the "business" evidence for how to apply evidence-based prevention the "right way" in military settings. The use of evidence-based information, often in the form of guidelines, will help the health plan ensure that they are providing effective and efficient services for beneficiaries. Finally, evidence strongly supports the importance of assuring a full complement of services is available to achieve population health improvement objectives for military communities. Worksite and community-based programs can be developed using evidence-based interventions. Some of the most effective programs will be provided by helping agencies that are outside the MHS programs and either on base or in the nearby community (http://www.thecommunityguide.org). *Community outreach* is needed to extend beyond the boundaries of programs managed within the MHS to partner with the many community-based services that so greatly impact the health of military populations.

Information Management

Information management is critical to population health. Assessing the health status of populations is a data-rich and information-intensive process. Planning must link information about health problems in the community with information about available resources; and the cyclical process is repeated using periodic performance monitoring and reassessment. Population health information management must provide *actionable information that is data-driven and that drives data* and *knowledge management and transfer*. Throughout the DoD, organizations should have an information management strategy that incorporates high quality data collection, proper epidemiologic and biostatistical analysis, interpretation, and dissemination; collection and transfer of knowledge on best practices; and comprehensive education.

Actionable Information

There is a growing demand for data-driven plans, policies and programs in health agencies. The rapidly expanding availability of health data and better tools for collecting and analyzing data both drives this demand and makes achieving data-driven health operations more challenging. Health agencies must be able to effectively analyze and interpret data to identify community health problems, establish policies and programs to address problems, and measure progress in resolving problems. There is also an established management axiom "what gets measured gets done" (American Society of Public Administration 1998). Combining the demand for data-driven operations by health agencies with the management axiom creates an imperative for acquiring and utilizing population health data: *if what gets measured gets done, then what needs to be done must be measured*. The challenge is to translate the plethora of health data available today into actionable information that is useful at the level where policies and programs are developed, resourced, and implemented. Figure 8 depicts the iterative nature of population health information management, which directly mirrors population health planning and performance measurement. Health data on individuals and communities are collected through information management tools. These data include the distribution of diseases, injuries, behaviors, occupation, demographics, business and other characteristics related to health and health services. The data are retrieved, analyzed, and interpreted to synthesize health information for dissemination. Information that is disseminated to providers such as PCMs in primary care clinics, community program managers, or forward deployed health protection teams, must be actionable at the level the providers impact individual, worksite (unit or command), and community health. Actionable information will allow providers to determine who needs what services, and when and where the services are needed. Providers use the population health information to develop and deliver health services to individuals and

communities. Similarly, the health data are retrieved, analyzed, and interpreted to support aggregation of information from many communities to develop enterprise level metrics. Enterprise level metrics include measures of health status across DoD communities, business measures such as expenses and revenue, and performance measures that elucidate overall quality and efficiency of services provided. Senior leadership at the intermediate and headquarters levels use metrics to develop the highest level plans, policies and programs that cascade back to providers at the "deck plate."

Using Objectives for Improving Health Status and for Monitoring Performance

If the health status of a population is to be improved then there must be identified objectives for health that policies and programs are designed to achieve. *Objectives* are quantifiable measures of the desirable effects of interventions that are to be achieved by a certain point in time. The Healthy People initiative and similar State and local efforts have embraced the use of health objectives to prompt action and measure progress in addressing health problems (McGinnis and Maiese 1997). Health organizations must use population-based objectives to plan, resource, implement, and evaluate programs to improve individual, worksite, and community health. Progress measurement can be easily linked to the planning process when interventions have carefully developed objectives. These objectives should be measures of population health. Healthy People 2010 is a national initiative to advance a comprehensive health promotion and disease prevention agenda that includes 467 population-based objectives (HHS 2000). The MHS, Regions, and MTFs may adopt some of the objectives to target health problems or develop unique objectives.

Leading Health Indicators and National Objectives for Improving Health

Healthy People 2010: Objectives for Improving Health (http://www.health.gov/healthypeople/document) presents a comprehensive set of health objectives that captures objectives for morbidity and mortality and objectives for risk factors and direct and indirect determinants of disease, injury, and disability. Healthy People 2010 objectives are intended to aid local health initiatives, foster development of increas-

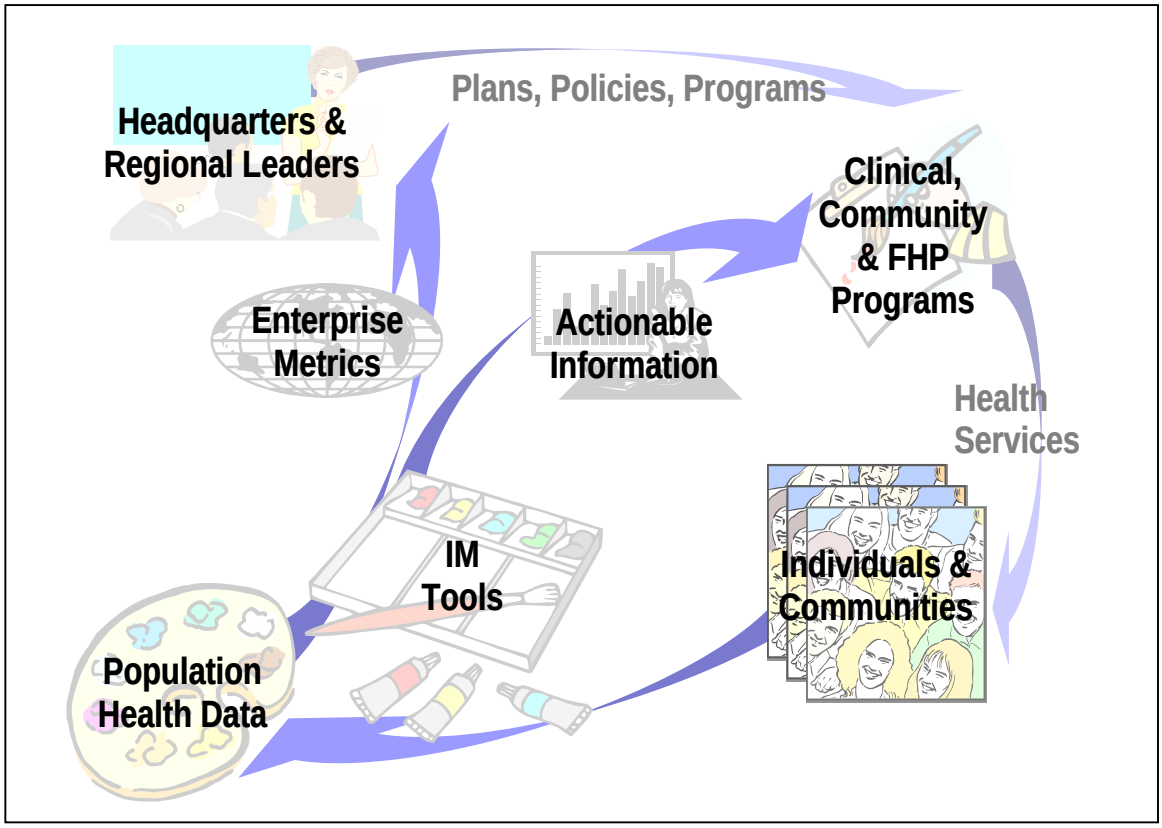


Figure 8.
Population health information management

ingly detailed data, and measure progress. However, there is no implied priority for the objectives and communities and health organizations will use objectives based on their specific priorities (HHS 2000).

To create a snapshot view of progress toward meeting the health objectives for the nation, ten Leading Health Indicators (Figure 9) were created to represent a small subset of the 467 objectives in Healthy People 2010. The 21 objectives in the Leading Health Indicators are examples of the comprehensive Healthy People 2010 objectives that can be adopted or adapted for local population health programs.

Population-based objectives that have clearly defined numerators and denominators will drive programs to demonstrate results and allow measurement of progress in population health. The numerator must describe the health event the intervention will modify, for example, the number of children and adolescents at Scott AFB who are overweight or obese. The denominator must clearly describe the target population for the intervention, the number of children and adolescents enrolled to Scott AFB. Objectives also must include the direction the intervention is intended to move the measure from its baseline, or current level, and must be linked to a target to achieve by an established time. The Healthy People 2010 objective for overweight and obesity in children and adolescents is: *Reduce the proportion of children and adolescents who are overweight or obese*. The national baseline is 11 percent and the target for the year 2010 is 5 percent (HHS 2000). Each objective must have a source for appropriate numerator and denominator data to measure and improve health. Sources for data should support periodic measurement to monitor progress over time. While it can be difficult to find reliable ongoing sources of data for many health problems, the imperative to address a problem can drive the identification and development of the data that are needed.

Outcome, Impact and Process Measures

Community health efforts must be monitored and evaluated for short, intermediate, and long-term effectiveness. Measuring the results of programs is important to reinforce and improve performance. In health programs, it is how progress toward the vision for community health is monitored. Processes for monitoring and evaluation can be divided into three levels, *outcome, impact, and process objectives* (NACCHO 1991; HHS 1993).

Health data used in assessment, surveillance and planning can be linked to methods of evaluation through population-based objectives. In other words, data used during the planning process to develop objectives for interventions can be the same data that support evaluation and monitoring with objectives. Health *outcome objectives* are typically measured using long-term measures that include life expectancy, quality of life, and mortality and morbidity rates. It may take a very long time to demonstrate changes in health status outcomes because much of the current burden of mortality and morbidity is related to chronic diseases (Rohrer 1999). While in many cases, changes in morbidity and mortality outcomes, such as communicable disease and injury morbidity and mortality rates, can be demonstrated over much shorter intervals. Programs, both MHS-wide and local should develop true outcome objectives for programs that target health problems such communicable disease and injury morbidity and mortality (Rohrer 1999).

Impact objectives incorporate intermediate and short-term measures of changes in risk factors and direct and indirect contributing factors for disease or injury. Impact objectives may necessitate measuring prevalence or incidence rates of behaviors, environmental risks, and biological risks such as hypertension and hyperlipidemia. The time interval for measuring changes in impact measures may be as long as 3-5 years (NACCHO 1991).

There are two different ways to consider *process objectives*. One type of process objective is monitored by measuring the services provided to populations over a specific period of time; yielding population-based rates (NACCHO 1991). An example would be measuring the proportion of children who have received recommended immunizations over a 12-month interval. Receiving recommended immunizations is a process of health services, and some would call its measure a process measure.

Another way to consider process measures is to look at processes as the activities (or tasks) within a program. In this context, process objectives describe expected counts of activities in an intervention rather than population-based rates (HHS 1993). Both types of process objectives are very useful for monitoring and evaluating programs at the local level and should be measurable at intervals of 1-2 years (NACCHO 1991).

The most frequently collected population

Leading Health Indicators and Corresponding Healthy People 2010 National Objectives

Leading Health Indicator	*Corresponding Objectives*
Physical Activity	22-7. Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness 3 or more days per week for 20 or more minutes per occasion. Target: 85%; baseline: 64% 22-2. Increase the proportion of adults who engage regularly, preferably daily, in moderate physical activity for at least 30 minutes per day. Target: 30%; baseline: 15%
Overweight and Obesity	19-3c. Reduce the proportion of childhood and adolescent who are overweight or obese. Target: 5%; baseline: 11% 19-2. Reduce the proportion of adults who are obese. Target: 15%; baseline: 23%
Tobacco Use	27-2b. Reduce cigarette smoking by adolescent. Target: 16%; baseline: 36% 27-1a. Reduce cigarette smoking by adults. Target: 12%; baseline: 24%
Substance Abuse	26-10a. Increase the proportion of adolescents not using alcohol or any illicit drugs during the past 30 days. Target: 89%; baseline: 77% 26-10c. Reduce the proportion of adults using any illicit drug during the past 30 days. Target: 3%; baseline 6% 26-11c. Reduce the proportion of adults engaging in binge drinking of alcoholic beverages during the past month. Target: 6%; baseline: 16%
Responsible Sexual Behavior	25-11. Increase the proportion of adolescents who abstain from sexual intercourse or use condoms if currently sexually active. Target: 95%; baseline: 85% 13-6. Increase the proportion of sexually active persons who use condoms. Target: 50%; baseline: 23%
Mental Health	18-9b. Increase the proportion of adults with recognized depression who receive treatment. Target: 50%; baseline 23%
Injury and Violence	15-15. Reduce deaths caused by motor vehicle crashes. Target: 9 per 100,000; baseline: 15.8 per 100,000. 15-32. Reduce homicides. Target: 3.2 per 100,000; baseline: 7.2 per 100,000
Environmental Health	8-1a. Reduce the proportion of persons exposed to air that does not meet the U.S. Environmental Protection Agency's health-based standards for ozone. Target: 0%; baseline: 43% 27-10. Reduce the proportion of nonsmokers exposed to environmental tobacco smoke. Target: 45%; baseline 65%
Immunizations	14-24. Increase the proportion of young children who receive all vaccines that have been recommended for universal administration for at least 5 years. Target: 80%; baseline: 73% 14-29a & b. Increase the proportion of noninstitutionalized adults who are vaccinated annually against influenza and ever vaccinated against pneumococcal disease. Target (influenza): 90%; baseline: 63%. Target (pneumococcal): 90%; baseline: 43%
Access to Health Care	1-1. Increase the proportion of persons with health insurance. Target: 100%; baseline: 86% 1-4a. Increase the proportion of persons who have a specific source of ongoing care. Target: 96%; baseline: 86% 16-6a. Increase the proportion of pregnant women who begin prenatal care in the first trimester of pregnancy. Target: 90%; baseline: 83%

Figure 9. Healthy People 2010 Leading Health Indicators (HHS 2000)

health performance measures should be those that discern the effects of local programs on near-term health objectives, typically the priority impact or process measures. Less frequent measures, such as overall health status or health outcome measures, should be emphasized in less frequent, long-term program evaluations. MTFs and local communities may not be able to demonstrate how interventions result in changes in long-term health outcomes. Therefore, measuring progress toward impact and process objectives for interventions may be sufficient if interventions that are known to improve health outcomes are chosen (i.e., evidence-based interventions) (APHA 1991).

Increasingly, health data are being used to support population-based health planning and measurement of progress (HHS 2000). Demonstrable changes can be found in the Healthy People initiative coordinated by the U.S. Department of Health and Human Services. In the succession of decennial health objectives for the Nation included in Healthy People reports, there has been increasingly robust epidemiologic information about the distribution and causes of disease and disability in the United States. There also have been an increasing number of health objectives to reflect the breadth and depth of health problems among communities in the United States. More states and local jurisdictions are using the approach of Healthy People to support health planning and to establish their own health objectives.

The use of outcome, impact, and process objectives, and performance measures, or *metrics*, is the "medium" or "language" of conducting quality clinical, worksite, and community-based services and Force Health Protection. Quality health services are in the hands of each provider. Providers typically practice based on the information they learned in training. The explosion of information availability has opened incredible opportunities for bringing current, critically analyzed information to providers in a manner that is immediately relevant and useful in making health services decisions. Therefore, use of knowledge management principles and continuous monitoring of performance effectiveness are crucial to ensuring the quality of all health services in the MHS. Health status and program measures that are derived from objectives are the best tools to accurately describe and monitor effectiveness of health services provided.

Knowledge Management and Transfer

The MTFs, Regions, and other offices within the MHS and DoD can operate as learning organizations by seeking out and adopting or avoiding practices based on the experience of others. This requires that knowledge be collected, organized and disseminated within the MHS agencies and between MHS offices and peer organizations in the private and government sectors.

The explosion of information technology over the last quarter century has ensured that there is no shortage of health information from which to learn and improve. Population health improvement must benefit from the dawning knowledge age. The MHS and DoD can employ enterprise level knowledge management and transfer strategies that ensure system-wide visibility to population health "knowledge." The strategies will include methods for collecting lessons learned and best practices, analyzing and evaluating the experiences of others and new research to identify what will and will not work in MHS programs. The population health knowledge that is collected will be managed to maintain currency and to make it easy for others to find and utilize the knowledge. It will be disseminated, or pushed, out to appropriate levels of the enterprise to benefit from every opportunity to learn.

Finally, a major strength of the MHS is the control of educational process. To cope with change and foster a learning organization, while rapidly changing the culture of the organization, a comprehensive program of formal education needs to be established. Such a curriculum must impart knowledge to all levels of the organization as well as to suppliers and customers. Education in the principles, processes and tools for population health improvement must be incorporated into each Service's education programs. The basic tenets must be taught to the widest audience and role-specific education and training are required for each member of the health services team. Military and civilian staff members and managed care support contractors must understand the basic principles of population health improvement and the specific goals. The investment of time, money and effort toward these education and orientation goals will be returned many-fold in the form of facilitated start-up as well as better clinical outcomes and quality of care.

Resources for Population Health Improvement

Population health improvement in the DoD cannot become a reality unless resources (staff, space, money, etc.) are aligned with population health improvement policies and programs. Resources must be distributed among the policies and programs under the areas of Force Health Protection, worksite and community-based, and MTF programs and the TRICARE health plan so that each program area maximally contributes to improving the health of military communities. It takes unrelenting planning and difficult decision-making to ensure that scarce resources are provided to develop and implement those programs that are most effective in achieving population health objectives.

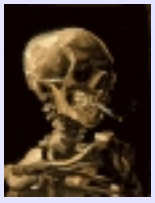
The current portfolio of programs has been developed over many years of planning, programming and budgeting. Medical readiness programs have appropriately continued as a top-priority in support of the National Defense Strategy. However, the current Force Health Protection doctrine may drive new programs to ensure the three pillars of *healthy and fit force*, *casualty prevention*, and *casualty care and management* are all in place.

Resource requirements to maintain and improve programs under the TRICARE health plan have put continued pressure on the funding for all programs in the MHS. This pressure will continue indefinitely as the beneficiary population ages and as health care technology drives cost increases ahead of overall inflation. Public law mandates TRICARE benefits and therefore many of the programs under the TRICARE health plan drive "must pay" resource requirements. Such requirements threaten to squeeze out new programs for population health improvement and programs that are not mandated by law. For example, many worksite and community-based programs that might be more cost-effective than some under the TRICARE benefit may not receive adequate resources to be effective or may, unfortunately, receive no funding at all.

There are several components of population health improvement outlined in this plan and guide that require new or renewed attention in the resource prioritization processes. In addition to the redirection of resources to new Force Health Protection programs, enhanced primary and secondary prevention benefits under TRICARE, and worksite and community-based programs, **the DoD must build a population health improvement capacity** at each level of the enterprise. The functions and benefits of population health support activities needed at the MHS and Region level are described in following sections. A plethora of functions needed to support population health at MTFs are described in detail in Section IV. Some of the key functions of population health support that must be inculcated in programs and funded accordingly include information management, education, community health planning, applied epidemiology, health services research to identify effective evidence-based interventions, and function-driven information technology.

The MHS must also increase the employment of distinct professional skills in order to build a population health improvement capacity. For example, professionals who have skills in data development and analysis, applied epidemiology, health education, health services research, program evaluation, and community health planning are required at the MHS and Region levels.

Smoking has been identified as the major risk factor for not just one but many of the top health problems in the local military community. Numerous direct and indirect



contributing factors and possible interventions to mitigate them have also been identified. The next challenge is to review the evidence on possible interventions to find effective, evidence-based activities to include in smoking reduction programs on and near the base. The evidence will show, for example, that no single intervention is, by itself, sufficient to greatly impact smoking in a community. In fact, the best approach is to use a portfolio of clinic-based, worksite, and community-based policies and programs (examples are presented in the sections below). It is essential to set achievable near and intermediate term objectives for the programs and identify sources for baseline data and for data that will be used to monitor progress. Objectives from Healthy People 2010 can be adapted, for example:

1. Reduce the proportion of active duty personnel who smoke cigarettes. Target (3 yrs): 25%; baseline 30%.

2. Increase smoking cessation during pregnancy for enrolled women. Target (1 yr):

MTFs and other program offices need additional prevention and population health trained professionals such as preventive medicine and public health specialists, community health educators, health promotion specialists, biostatisticians, and data analysts.

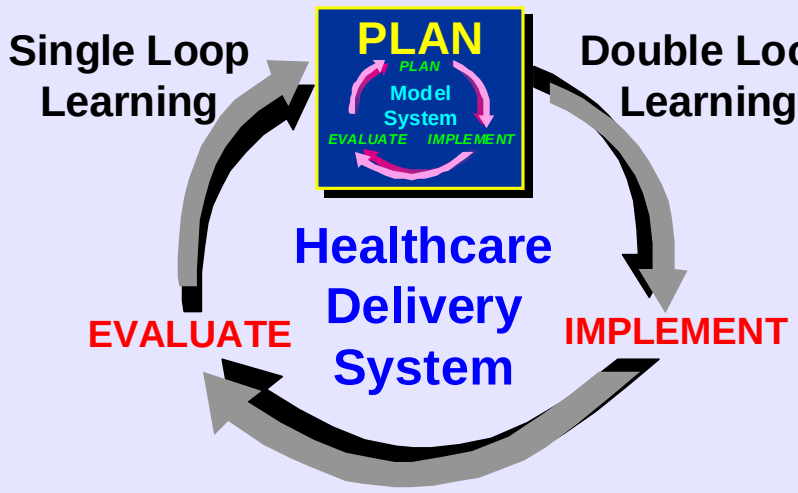
Inspection Item

An effective means for ensuring that population health improvement initiatives become a reality across the MHS is to insert the core activities into each Service's health services inspection program. This is consistent with the dynamic progression of inspections to remain ahead of the best principles and practices in the health services industry and MHS-specific requirements. A set of population health process criteria used during inspections at AF MTFs is available through the Population Health Support Office (https://phsd.afms.mil/PHSO/).

Incorporating Utilization Management and Review

Some readers may recognize that many of the principles, processes, and tools discussed have evolved from earlier concepts of utilization management (UM) and utilization review (UR). Utilization Management and Utilization Review plans and processes currently in place should be continued where they have proven valuable (Health Affairs Policy http://tricare.osd.mil/policy/fy98/umpd9831.html). Selected elements of UR and UM are key tools for improving the health of the MHS beneficiaries (see Forecast Demand, Manage Demand, and Manage Capacity, Section IV). These elements must be included in population health improvement programs. Under TRICARE, population health improvement plans in the Direct Care System must be integrated with the Managed Care Support Contract (MCSC) network as well as other MTFs in the region, including coordination with Centers of Excellence (COE). For population health improvement to be effective, implementation strategies must be comprehensive, systematic, and ongoing throughout the continuum of care. Integrated strategies should include all aspects of medical, surgical, and mental health care, both inpatient and outpatient, encompassing all clinical and community services that impact on population health.

Utilization management programs can further evolve to effective population health improvement programs through the use of evidence-based, best clinical and business practices (benchmarking). Implementation of these practices must be tailored to the facilities and the population they support. One goal is to reduce unwarranted variation in the management of acute and chronic diseases and injuries in the enrolled



Current research shows that environmental stimuli perceived as a problem leads individuals (and organizations and other systems) to learn something new to solve that problem. There is a problem identified; one then gathers the necessary information and applies it to correct the problem. In a simpler example: the thermostat is set at 75°F, the ambient temperature is 70°F, so the furnace is turned on. In such cases, we apply information to get the "right outcome." This is the case of single loop learning.

In the case of double loop learning, we question the paradigm. Is the way that we are solving the problem the correct way? More simply, is the thermostat set at the right temperature? Double loop learning is all about thinking about what we do to explore the underlying patterns we use to learn and solve problems. Double loop learning is a reflective practice.

If we are to understand and improve how we learn and solve problems, we must be able to step out of the subjective realm of experiencing the problem and objectively observe ourselves learning and applying the problem solving style we use. We must watch what we do, how we do it, and how we feel as we do it, all while we

population. Population health improvement plans will use the best of UM and UR. Patient and staff education will be essential. There will be an increased focus on health promotion and prevention of disease and disability. Primary care managers (PCMs) will be required to identify sub-populations within their panels of patients. There must be feedback to PCMs on the individual and aggregate health of their patients and the appropriate use of medical resources to accomplish this.

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